



**29<sup>th</sup>** Annual **INCOSYMP**  
international symposium

Orlando, FL, USA  
July 20 - 25, 2019

# Systems Engineering & Complex Systems Governance – Lessons for Better Integration



**Who's teaching  
what the world  
needs most?**









# High Op Tempo



**Short term priorities  
vs.  
Long-term sustainability  
...systemic risk...**





# Cyclone YASI, 2011



# Rizzo Reforms



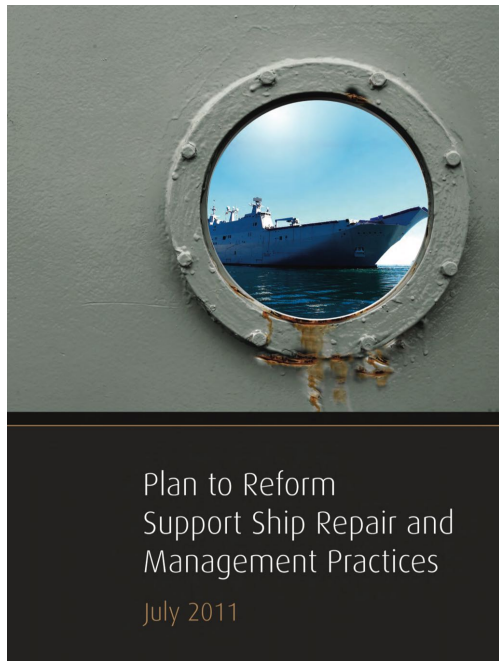
## Integrated Risk Management

Plan to Reform  
Support Ship Repair and  
Management Practices

July 2011



# Story of two halves...



2012-2014

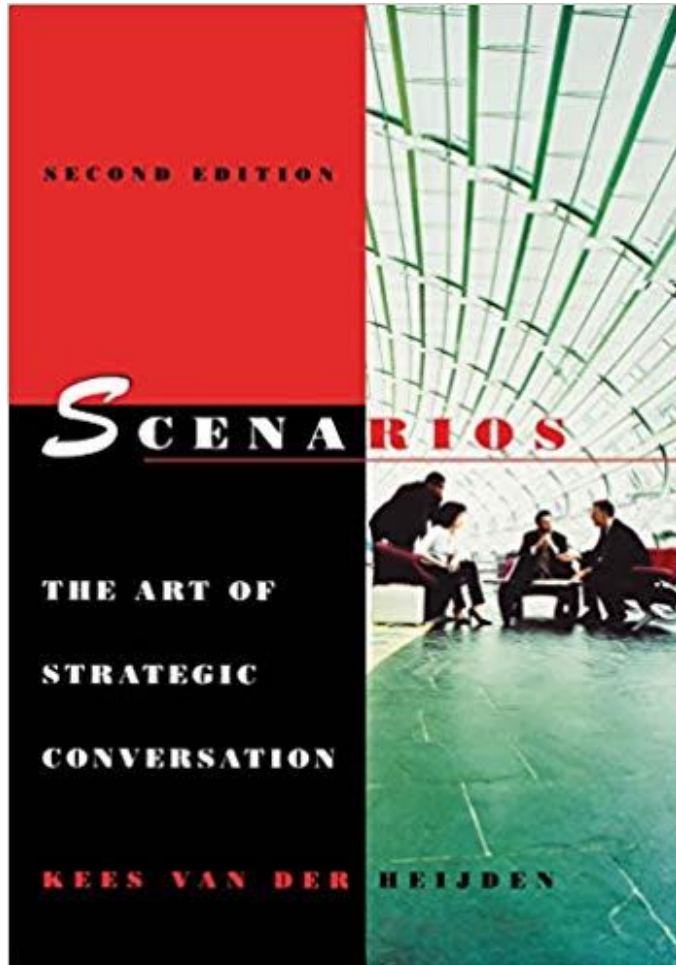
Risk management  
+ Systems engineering

2015-2018

Complex systems governance  
Systems engineering embedded



# Why ...



“ Where uncertainty is present, strategy moves from **finding the one best strategy** to **creating the most skillful process...**

Kees van der Heijden, 1996

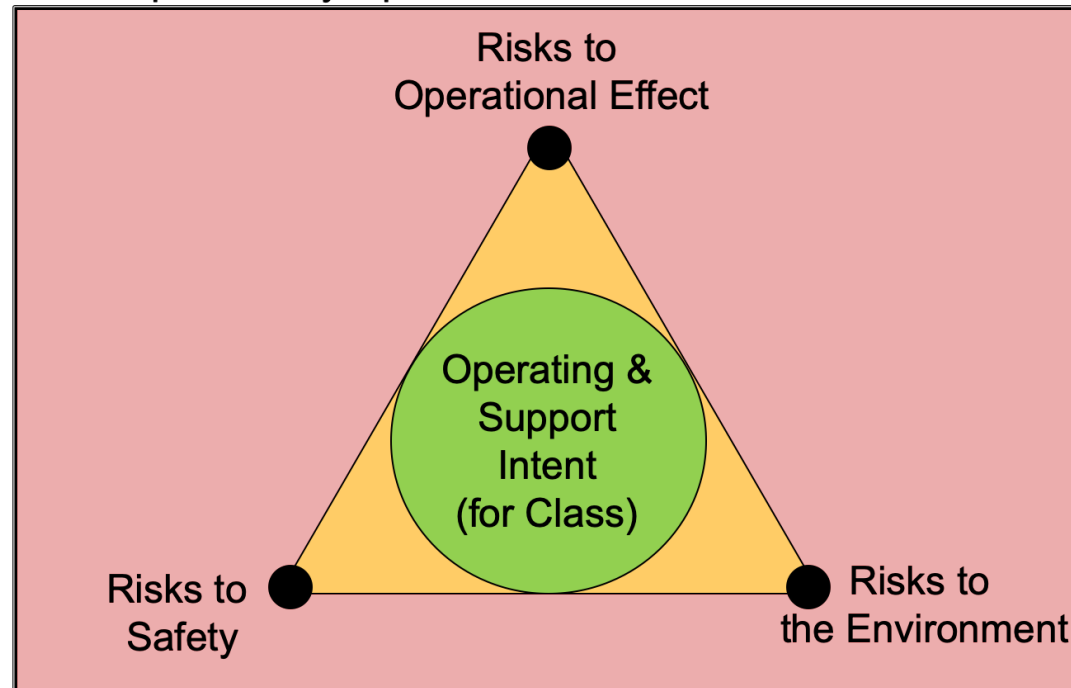




# Round 1: 2012 - 2014

## Concept for Risk Categorisation

Full scope of Navy Operations

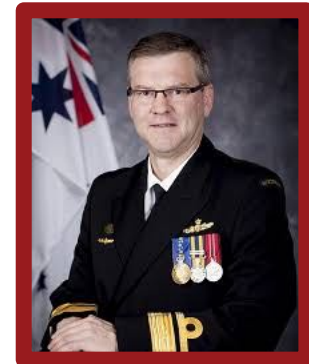
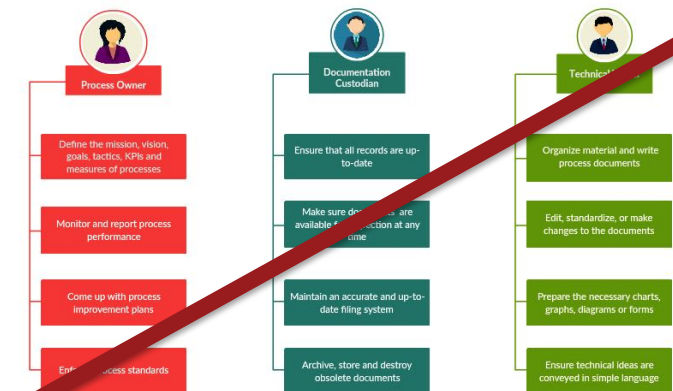


- Risk to maritime system managed by operator within OSI
- Risk managed with advice of authority for safety / operations / environment
- Risk managed with authority (or delegation) of Chief of Navy

## Systems Documentation



## Proposed Organisation Design





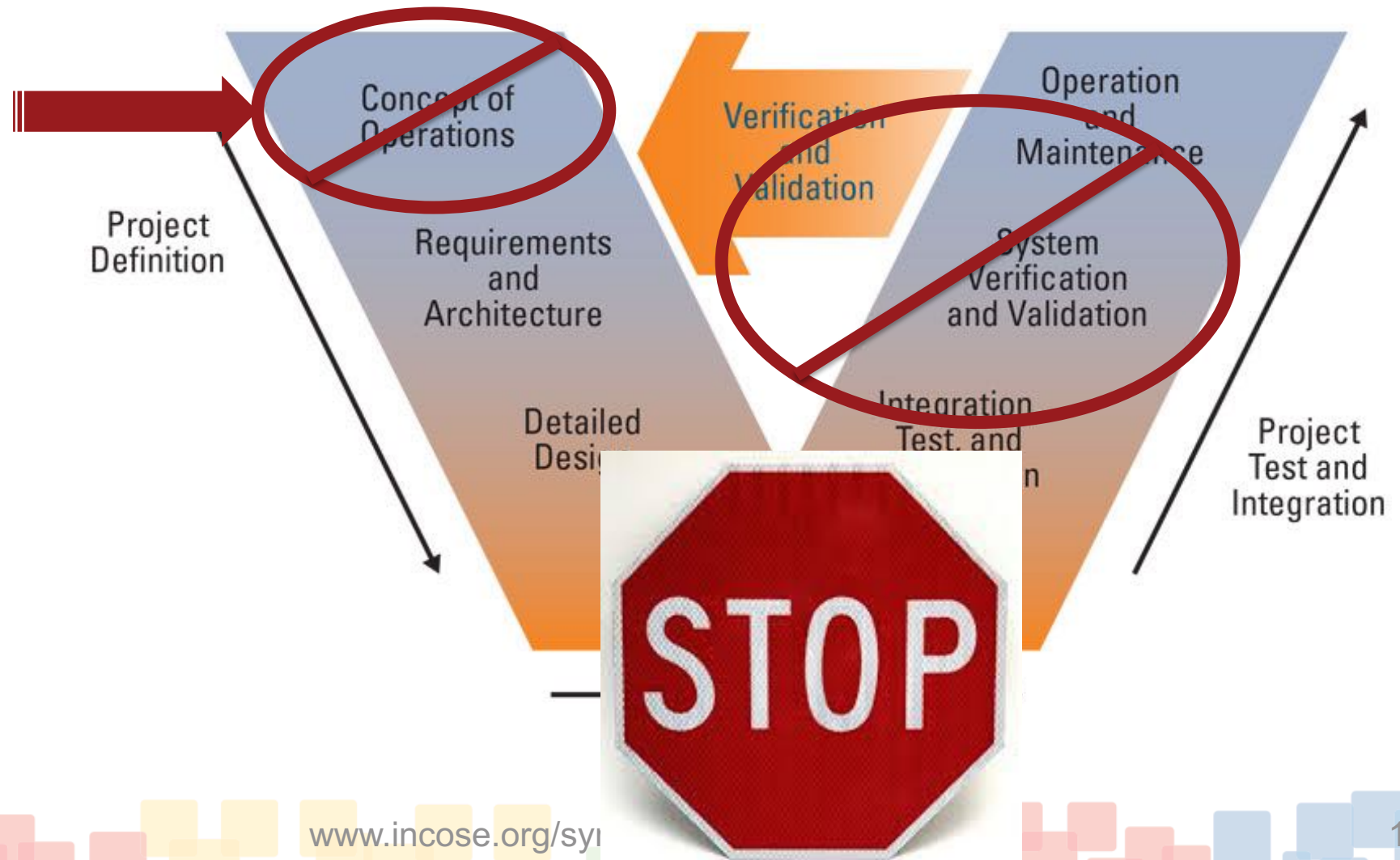
# Round 1: 2012 - 2014

## Integrated Risk Management



Plan to Reform  
Support Ship Repair and  
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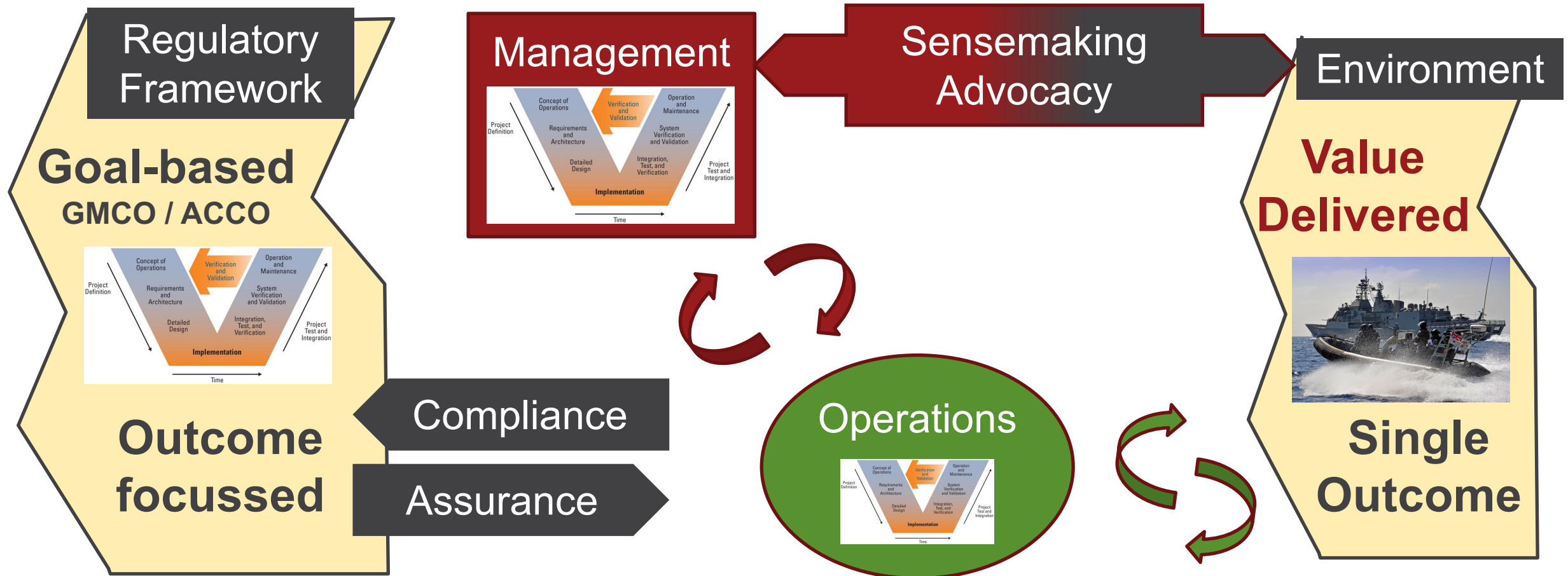
July 2011







# Round 2: 2015 – 2018



# Main differences (1)



**EDUCATE  
TO  
AVOID  
MODE LOCK**  
(Don't rush to action)



# Main differences (2)



## OUTCOME FOCUS

(Equiv. 1<sup>st</sup> Principle of War)





# Main differences (3)



## PRINCIPLES FOR BEHAVIOUR (ROLE MODEL)





# Lesson 1

**START WITH  
STRATEGIC  
THINKING**

Why?  
Who?  
What?

# Lesson 2



## **AVOID FUNCTION TRAP**

“  
Organisational silos disperse information and responsibility... [and] inhibit discussion of how risks interact. Good risk discussions must not only be confrontational but also integrative.

Kaplan & Mikes, HBR, 2012



# Lesson 3



**ITERATE**

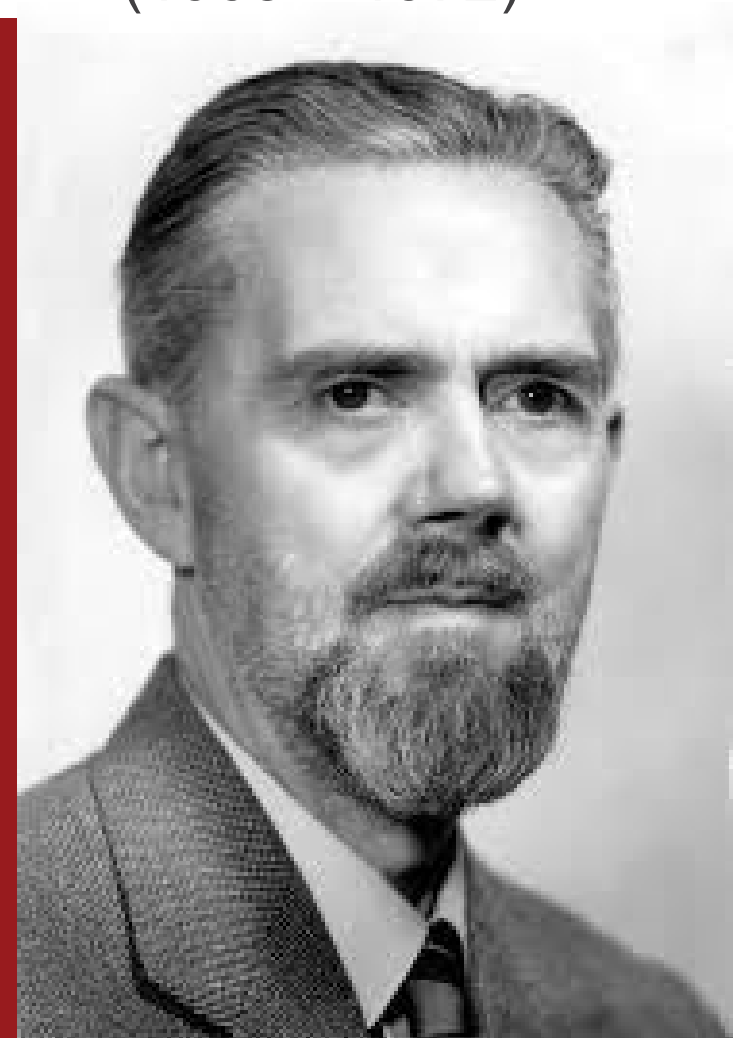
Design  
Build  
Implementation

# Lesson 4



William Ross Ashby  
(1903 – 1972)

## REMEMBER ASHBY'S LAW OF REQUISITE VARIETY





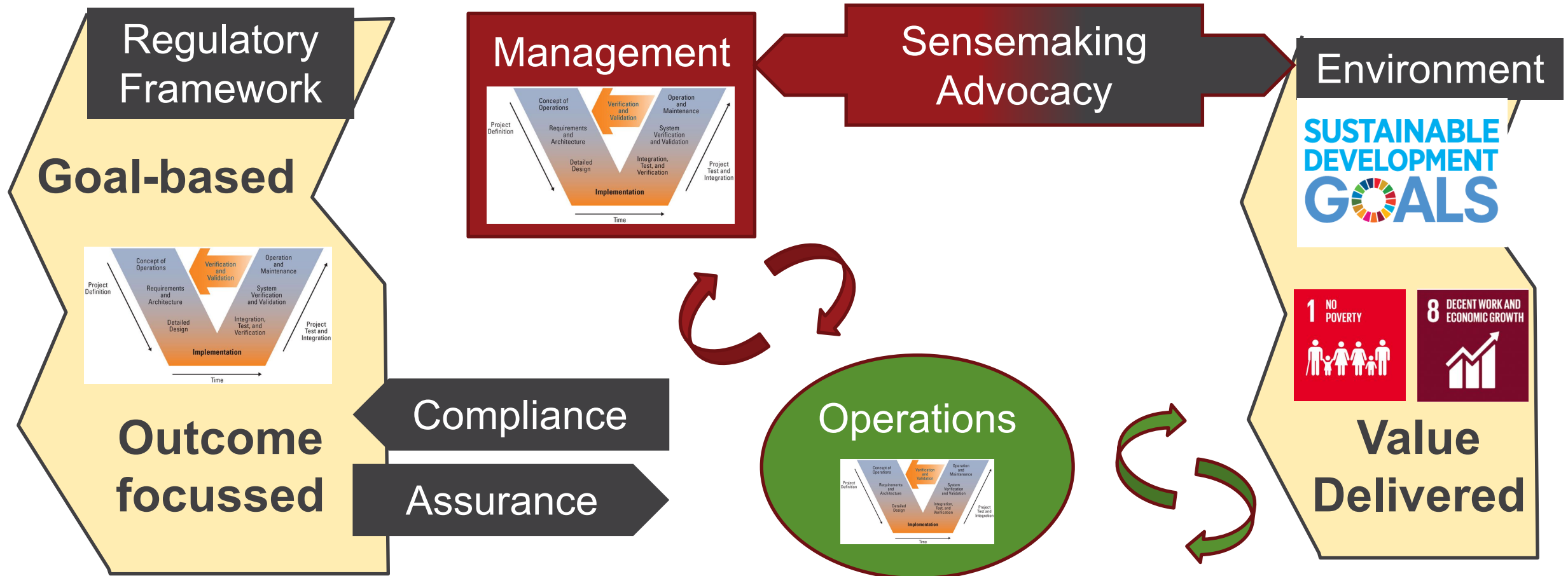
# Lesson 5



**EDUCATE**  
**OPERATIONALIZE EDUCATION**  
**SUPPORT SYSTEMIC INTERVENTION**



# Bigger goals might be possible...







# Systems Engineers Super Power?

# Integration

with the care of a physician...



## With thanks to co-authors...

- Dr. RICHARD HODGE
- Mr. STEPHEN CRAIG
- Dr. JOSEPH BRADLEY
- Prof. CHARLES KEATING





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